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medio pisce. Fascia fusca saturatior cingit caudam ante radios. Macula fusca orbicularis in medio pinnæ dorsalis ubi mutica.

Caput rostro elongato, fere ut in syngnathis, dentes in maxillis minimi. Narium foramina utrinque 2 ante oculos, membranæ branchiostegæ officula 5. Opercula branchiarum squamis tectæ, ut in reliquis congeneribus. Pinnæ dorsi et ani æquales, valde transversæ, et lateribus squamis tectæ. Dorsalis radiis 9-31 primoribus mucronatis, posterioribus 31 mollibus, longioribus. Pectorales radiis 14. Ventrals radiis 6 mollibus, excepto primo spinoso; eorum secundus reliquis longior. Ani radiis 3-20 posterioribus 20 longioribus, mollibus; primis 3 spinosis, caudæ radiis 14, æqualibus; parva

Accedit proxime ad LABRUM rostro reflexo fasciis lateralibus tribus fuscis, Amœn. Acad. 1. p. 313.

XIV. *An Account of the Polish Cochineal :  
In a Letter to Mr. Henry Baker, F.R.S.  
from Dr. Wolfe, of Warsaw.*

Warsaw, April 4, 1763.]

Read March 29,  
1764.

**C**OCCI Polonici sunt ova, vel potius pupæ insecti nondum satis cogniti, quæ ad radices variarum plantarum adhærent, et versus finem Julii ab evulsis radicibus ope cultri abraduntur et colliguntur. Plantæ illæ sunt valde variorum, nec quotannis in una eademque specie reperiuntur

tur cocci illi, sed pro lubitu vagantur, hoc anno in hac, frequenti in alia planta. Communiter creditum, non inveniri nisi in sclerantho perenni calycibus fructus clausis, Linnæi, quod polygonum minus Bauh. folio et flore albicante, feminibus nudis oblongis. Hæc planta amat loca sabulosa; sed nimis est rara, ut notabilis cocci quantitas inde colligi possit. Uberior longe proventus est ejus in pratis pinguibus Podoliæ et Ucrainiæ: ibique invenitur supra omne genus fragariæ et potentillæ; sæpe etiam ad radices secalis, aliarumque plantarum, de quibus tamen nihil certi compertum habeo. Maxima copia collectum vidi ex potentilla alba Linnæi, fol. digitat. 5 natis, apice conniventi ferratis, caulibus filiformibus procumbentibus, receptaculis hirsutis: hanc nimirum indicare mihi videtur; ceterum ex fragraria flore albo, foliis lanceolatis, medio maximo, subtus villosis, supra viridibus cum tenui margine argenteo, caulibus debilibus hirsutis. Deinde ex pentaphyllo officinali, seu potentilla reptante Linnæi, fol. quinatis, caule repente, pedunculis unifloris. Postea etiam ex potentilla caulescente Linnæi fol. quinatis apice conniventi ferratis, caulibus multifloris erectis receptaculis hirsutis; de quibus specimina mitto.

Postquam copia horum cocculorum collecta est, immittuntur in ollam, et supra ignem torrentur quousque vermes enecati arbitrantur. In Augusto, insectum, ovum suum relinquit, et in planta tarde decurrit. Est insectum seminis cannubis magnitudine, totum molle, infra planum, supra ellipticum, seu ovatum, rugis transversis semicircularibus decem circiter a capite ad anum, quæ rugæ in inferiori abdominis parte in marginem quasi vel fimbriam coeunt, secundum circumferentiam abdominis inferiorem.

Caput

Caput parvulum ; thorax supra vix conspicuus. Color totius animalis obscure purpureo-brunneus. Totum corpus pilis tenuibus, argenteis longis (respectu insecti) undique tomentosum, ut videatur pulverulentum, vel farina alba conspersum. Pedes sex valde breves, minuti, nigrore splendentes, instructi unguibus acutis duobus. Antennæ duæ filiformes perbreves nigerrimæ : rostrum reflexum perbreve. An abdomen pone setosum ? ut dicit Linnæus. Saltem pili ibi videntur paulo crassiores et longiores, sed similes reliquis. An volatilia fiant, expiscare nondum potui, nec sexum quidem internoscere potui. Sed dabitur, Deo dante, opportunior occasio, in hæc inquirendi. Transformationes difficulter observantur, cum insectum delicatulum a quavis injuria facile vitâ privetur, et illo tempore intra fissuras radicum abscondat se. Optimam figuram hujus insecti nuper dedit Ledermüller Norimbergensis in observationibus microscopicis.

Color inde lanæ, gossipio, lino, conciliatur dilute carmesinus. Modus tingendi talis est. Coquunt coccum in aheno cupreo, cum liquore, quem *kwas* (acidum) dicunt, et qui in Podolia, Russia, et Ucraina, pauperibus pro potu ordinario inservit. Parant vero hunc potum *kwas* ex farina secalina, quam infundunt aqua multa calida, et in loco tepido relinquunt, donec fermentatione ace scat, et limpida fiat. Quantum quotidie de hoc liquore ebibunt, tantum addunt novæ aquæ cum manipulo farinæ. Breviori tempore idem fit, si fermentum acidum panis secalini pistorum cum multa aqua diluatur, et in locum tepidum reponatur. Jam in hoc liquore coccum diu coquunt. Enascitur spuma et pinguedo valde multa, instar sebi alba, quam sollicitè semper auferunt, usque dum talis jam nihil appareat. Erit liquor pulcre sanguineus.

neus. Jam, lanam puram albam in alio ahenò cum simili liquore *kwas*, et mediocri aluminis quantitate decoquunt, et salibus his bene imbutam exsiccant. Tandem lanam ita præparatam, in liquorem illum sanguineum immittunt, et per aliquot minuta coquunt: sic in momento omnis color lanæ adhæret, et liquorem instar aquæ limpидum relinquit. Lanam sic tinctam aqua frigida abluunt et exsiccant.

Rudis hæc tractatio docet, quantum ille color emendari posset, si in vase stanneo, cum sale ammoniaco et solutione stanni tractaretur. Narrarunt mihi collectores, si animalcula viva colligantur et enecentur, colorem inde obtineri multo elegantiorē; cui facile crediderim, si præsertim eadem sollicitudine colligerentur, ac sit cum cocco Mexicano (cui de cetero nostrum insectum valde simile videtur), et loco tostionis, in aceto enecarentur. Multum Chocimi inquisivi in id, quo Turci purpureo colore lanam inficiunt: sed tinctura illa non nisi in Asia minori exercetur. Omnes tamen dicunt, tincturam hanc obtineri ex baccis, quæ ad radicem plantæ Armeniacæ, quam Romam appellant, crescunt. Forte hæc planta eadem cum potentilla alba, et forte etiam pulchritudo coloris non nisi ab artificio tinctoris pendet.

Quantitas cocci hujus ad externos exportati, ex Podolia, facile aliquot millia librarum quotannis excedit, et præterea multum domi consumitur. Maxima pars in Turciam abvehitur, magna etiam Bressaviā venit. Constat libra una 8-10 florenis Polonicis, (sive 4-5 shillings) et unâ librâ fere 20 libræ lanæ tingi possunt.

*Further Account of the Polish Cochineal: In a Letter from Dr. Wolfe to Mr. Henry Baker, F. R. S.*

Read April 12,  
1764.

**L**A S T summer I amused myself with the Polish cochineal. It is unknown and neglected in this country. The several kinds of Potentillas are here very rare, and it was only upon the polygonum minus, or scleranthus perennis Linnæi, that I found the cochinille. I gathered about 300 of the coccusses, and put them with the plants and some sand in large pots. They are of different sizes. The insects creep out of their coccusses from the beginning of June till the middle of August: about fifty got out under my eyes. They are all exactly of the same shape: but some are three times smaller than others, according to their coccusses. The coccus is a thin round white skin. The insects are all hairy more or less; some are of a darker colour, some more crimson; some seem somewhat longer, others broader. But these differences seem to depend on their voluntary extension, and on their age, because they grow from day to day darker and more hairy. No mouth is to be seen, but a deep plait or furrow at the upper part of the breast. Two extremely small dark points seem to be the eyes. The two horns are thick, twisted like a screw, of the length of the breast; they end in an obtuse point. The two fore legs are twice the size of the four hinder legs, they have all sharp black incurved claws. The shape of the wrinkles and furrows may be seen in the drawing. It is impossible to find marks of the sex; and though they join sometimes their anusses, yet they do it so loosely,

loosely, that it cannot be accounted for a copulation. They seem to eat nothing at all. They creep about the plant a week or two, going often underground, and getting up again. Then they make themselves a deep cylindrical hole in the sand down to the hard bottom of the pot, the end of which they cover with a fine white silk growing upon their bodies. There they lay their eggs and die. Others, who are disturbed in their work, grow weary and white, as if they were powdered all over with a white meal, which through a glass appears to be very fine white silky hairs, coming out over all the body. At last they lay them down upon their backs: the silky hairs grow very fast, to the length of one inch and a half, and the insect twists with its claws the hairs all round its body, so as to resemble a small heap of cotton; but the hairs are so tender, that a small wind will tear and destroy it. In this heap of cotton they lay their eggs, from fifty to an hundred, and then they die. Thus they remain till the middle of July. Afterwards, though they make their holes, or their cotton heaps, yet they die without laying eggs. The eggs are crimson, transparent, scarce visible, long, and round-pointed at both ends. In a week's time the young insects creep out: they are like their parents, but smooth, transparent, and crimson. I presented them every day fresh roots of the polygonum, but I cannot say they have eat any of them. In a week or two they disappear, going under ground. I preserve all these things. The insects seem now all dead, and so do the young ones, buried up in sand: but I hope next spring to see them alive, and to prosecute their farther change. I have killed about one hundred of  
the

the insects in hot vinegar, as it is done in Mexico; and now I shall attempt to dye some woolly threads in the common way of the scarlet dyers. In the microscopical observations of Ledermuller at Nuremberg, you will find tolerable drawings belonging to this matter. In the beginning of August, I found an extremely small white fly, somewhat like to what is supposed to be the male insect. It is a third part of the size of what is represented by Ledermuller. It has a body like a gnat, snow-white, powdered below, but gray shining upon its back, six tender snow-white legs without claws, a thick bulky head, two very small prominent eyes, two hair-like horns, two wings, large enough in comparison to the body, snow-white below, and shining gray above. The belly to the tail is taper, and at the tail are three white hairs, very tender, and four or five times the length of the whole fly. But as this was the single one amongst three hundred, and totally unlike in every part to the other insects, I doubt very much of its being of this genus.

I hope next summer will teach me more; and, if I should be happy enough to bring the matter to any clearness, I shall put my observations into some order, and send them over with proper drawings belonging to it. But as there is no doubt but this insect will be found as well in England as in Poland, I thought it proper to give you the account of my observations as far as they go. Perhaps somebody of yours will think it worth their while to look the next month of June at the *potentilla*, *fragaria*, and *polygonum minus* roots, and will very likely find these same things.

TAB. X. N°. 1. The cochineal insect of its natural size. 2. The same magnified. 3. The cotton. 4.



The cotton with the animal in the middle, and its eggs of the natural size. 5. An egg by the first magnifier. 6. Two coccuses greatly magnified. 7. The insect greatly magnified.

I send you also some of the insects killed in vinegar and dried. The cotton, and the supposed male insect. Some young insects. Some dead insects buried up in their cotton, some of which layed eggs, others not, some void coccus shells, some young ones, some eggs, etc. and also the polygonum minus.

P. S. The 12th of October, at 8 o'clock in the evening, we had here a strong aurora borealis. It lasted but a quarter of an hour. The shooting rays were white, and went all round from the horizon, making up at least three quarters of the circle of the horizon, the middle being just in the north. The rays pointed all towards one point of the heaven, which point was not the zenith, but at least 20 degrees farther directly against the South. It was a fair day. No wind or rain followed it; but the air was calm before and after.

Warsaw, Nov. 23, 1763.

